



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/688,974	10/21/2003	Howard E. Rhodes	M4065.0650/P650	8113
24998	7590	04/21/2005	EXAMINER	
DICKSTEIN SHAPIRO MORIN & OSHINSKY LLP			WILSON, SCOTT R	
2101 L Street, NW			ART UNIT	
Washington, DC 20037			PAPER NUMBER	
			2826	

DATE MAILED: 04/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/688,974

Applicant(s)

RHODES, HOWARD E.

Examiner

Scott R. Wilson

Art Unit

2826

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 February 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11-44 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 39 and 44 is/are allowed.
- 6) ☒ Claim(s) 11-13, 26, 34-38 and 40-43 is/are rejected.
- 7) ☒ Claim(s) 14-25 and 27-33 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 11-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Corrie et al.. As to claim 11, Corrie et al., Figure 4, discloses more than two non-overlapping gate structures (42), (32), (22) and (43) (col. 4, lines 55-56, 43-44 and 10) formed in a single layer on said substrate, said gate structures spaced apart by a gap of from 700 to 1000 Angstroms (col. 4, line 35).

As to claim 12, Corrie et al. discloses (col. 4, line 35) that the gap is greater than 300 Angstroms.

As to claim 13, Corrie et al., discloses (col. 4, lines 55-56, 43-44 and 10) that the gate structures are formed from polysilicon.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Corrie et al. in view of Ackland et al.. Corrie et al., Figure 4, discloses more than two non-overlapping gate structures (42), (32), (22) and (43) (col. 4, lines 55-56, 43-44 and 10) formed in a single layer on said substrate, said gate structures spaced apart by a gap of from 700 to 1000 Angstroms (col. 4, line 35). Corrie et al. does not disclose expressly a lightly doped region in the substrate between two adjacent ones of the plurality of

Art Unit: 2826

conductive gates. Ackland et al., Figure 3, discloses a semiconductor device comprising a substrate, a plurality of conductive gates (101) and (108) formed over the substrate, and a lightly doped region (112) in the substrate between the two adjacent conductive gates (101) and (108). At the time of invention, it would have been obvious to a person of ordinary skill in the art to form the lightly doped regions of Ackland et al. under the gate structures of Corrie et al.. The motivation for doing so would have been to allow the lightly doped region (112) to act as a source (Ackland et al., col. 5, lines 5-10). Therefore, it would have been obvious to combine Ackland et al. with Corrie et al. to obtain the invention as specified in claim 26.

Claims 34-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Corrie et al. in view of Ackland et al.. As to claim 34, Corrie et al., Figure 4, discloses more than two non-overlapping gate structures (42), (32), (22) and (43) (col. 4, lines 55-56, 43-44 and 10) formed in a single layer on said substrate, said gate structures spaced apart by a gap of from 700 to 1000 Angstroms (col. 4, line 35). Corrie et al. does not disclose expressly an image sensor or image processor. Ackland et al., Figures 1 and 2, discloses an image processing apparatus comprising an image sensor (101) for detecting an image and outputting image signals corresponding to the detected image, and an image processor (120), (125), (130) and (135) for processing the image signals outputted from the image sensor, wherein the image sensor comprises a substrate and two gate structures formed in a single layer on said substrate, said gate structures being spaced apart by a gap of a few tens of nanometers (col. 3, lines 60-63), which may be in the range of from 10 nm to 90 nm. At the time of invention, it would have been obvious to a person of ordinary skill in the art to form the image sensor and image processor of Ackland et al. with the gate structures of Corrie et al.. The motivation for doing so would have been to enable imaging of objects. Therefore, it would have been obvious to combine Ackland et al. with Corrie et al. to obtain the invention as specified in claim 34.

As to claim 35, Ackland et al., Figure 2 (col. 3, lines 60-63), discloses that the gap is within the scope of being from 30 nm and 100 nm.

As to claim 36, Ackland et al. discloses (col. 2, lines 43-47) that the gate structure shown in Figure 2 is in a CMOS active pixel, which is within the scope of being an imager. Although Ackland et al.

Art Unit: 2826

does not expressly disclose that the gate structure is part of a CCD imager, it is understood in the art that CCD imagers and CMOS imagers operate under the same charge-transfer mechanism. See, for example, applicants Background of the Invention, or Fossum et al., col. 1, lines 35-43).

As to claim 37, Ackland et al. discloses (col. 2, lines 43-47) that the gate structure shown in Figure 2 is in a CMOS active pixel, which is within the scope of being an imager.

As to claim 38, Ackland et al., Figure 3, discloses an embodiment with a photo gate (101) and transfer gate (108) (col. 5, lines 16-17) with a lightly doped region (112) between the two adjacent gate structures.

Claims 40-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Corrie et al. in view of Ackland et al.. As to claim 40, Corrie et al., Figure 4, discloses more than two non-overlapping gate structures (42), (32), (22) and (43) (col. 4, lines 55-56, 43-44 and 10) formed in a single layer on said substrate, said gate structures spaced apart by a gap of from 700 to 1000 Angstroms (col. 4, line 35). Corrie et al. does not disclose expressly an image sensor or image processor. Ackland et al., Figures 1 and 2, discloses a processing system comprising a processor for receiving and processing image data (35), and an image data generator (101), (107) for supplying image data to the processor, the image data generator comprising an image sensor for obtaining an image and outputting an image signal (35), an image processor (120), (125), (130) and (135) for processing the image signal and a controller (190) for controlling the image sensor and the image processor, wherein the image sensor comprises a substrate and two gate structures formed in a single layer on said substrate, said gate structures being spaced apart by a gap of a few tens of nanometers (col. 3, lines 60-63), which may be in the range of from 10 nm to 90 nm. At the time of invention, it would have been obvious to a person of ordinary skill in the art to form the image sensor and image processor of Ackland et al. with the gate structures of Corrie et al.. The motivation for doing so would have been to enable imaging of objects. Therefore, it would have been obvious to combine Ackland et al. with Corrie et al. to obtain the invention as specified in claim 40.

As to claim 41, Ackland et al. discloses (col. 2, lines 43-47) that the gate structure shown in Figure 2 is in a CMOS active pixel, which is within the scope of being an imager. Although Ackland et al. does not expressly disclose that the gate structure is part of a CCD imager, it is understood in the art that

Art Unit: 2826

CCD imagers and CMOS imagers operate under the same charge-transfer mechanism. See, for example, applicants Background of the Invention, or Fossum et al., col. 1, lines 35-43).

As to claim 42, Ackland et al. discloses (col. 2, lines 43-47) that the gate structure shown in Figure 2 is in a CMOS active pixel, which is within the scope of being an imager.

As to claim 43, Ackland et al., Figure 3, discloses an embodiment with a photo gate (101) and transfer gate (108) (col. 5, lines 16-17) with a lightly doped region (112) between the two adjacent gate structures.

Allowable Subject Matter

Claims 14-25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. No prior art discloses that claimed invention where the gate structures are transistor gates with or without lightly doped regions therebetween.

Claims 27 and 28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. No prior art discloses the claimed invention with a specific doping concentration for the lightly doped region.

Claims 29-33 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. No prior art discloses that claimed invention where the gate structures are transistor gates with or without lightly doped regions therebetween.

Claims 39 and 44 are allowed.

Conclusion

Art Unit: 2826

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott R. Wilson whose telephone number is 571-272-1925. The examiner can normally be reached on M-F 8:30 - 4:30 Eastern.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on 571-272-1915. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

NATHAN J. FLYNN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

srw
April 15, 2005